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# **Solar Thermal Collector Manufacturing Activities 2009**

**December 2010**

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## Preface

The U.S. Energy Information Administration (EIA) reports detailed historical data on solar thermal collector manufacturing activities annually in its report, the *Renewable Energy Annual*. This report, *Solar Thermal Collector Manufacturing Activities 2009*, provides an overview and tables with historical data spanning 2000-2009. These tables will correspond to identical tables presented in the *Renewable Energy Annual 2009* and are numbered accordingly.

Data in this report are based on manufacturing shipment information reported on Form EIA-63A, “Annual Solar Thermal Collector Manufacturers Survey.”

Prior editions of this report may be found on the EIA website at [http://tonto.eia.gov/reports/reportsD\\_archived.cfm?title=Solar Thermal Manufacturing Activities](http://tonto.eia.gov/reports/reportsD_archived.cfm?title=Solar%20Thermal%20Manufacturing%20Activities).

Definitions for terms used in this report can be found in EIA’s Energy Glossary: <http://www.eia.doe.gov/glossary/index.html>.

# Contents

Solar Thermal Collector Manufacturing Activities 2009 .....	1
-------------------------------------------------------------	---

## Tables

Table 2.1 Annual Shipments of Solar Thermal Collectors by Source, 2000 - 2009 .....	7
Table 2.2 Annual Shipments of Solar Thermal Collectors by Disposition, 2000 - 2009.....	8
Table 2.3 Annual Shipments of Solar Thermal Collectors by Type, 2000 - 2009.....	9
Table 2.4 Shipments of Solar Thermal Collectors Ranked by Origin and Destination, 2009 .....	10
Table 2.5 Shipments of Solar Thermal Collectors Ranked by Origin and Destination, 2008 .....	11
Table 2.6 Shipments of Solar Thermal Collectors by Destination, 2008 and 2009.....	12
Table 2.7 Import Shipments of Solar Thermal Collectors by Type, 2000 - 2009.....	13
Table 2.8 Import Shipments of Solar Thermal Collectors by Country, 2008 and 2009 .....	14
Table 2.9 Export Shipments of Solar Thermal Collectors by Type, 2000 - 2009.....	15
Table 2.10 Export Shipments of Solar Thermal Collectors by Country, 2008 and 2009 .....	16
Table 2.11 Distribution of Domestic Solar Thermal Collector Shipments by Customer Type, 2008 and 2009....	18
Table 2.12 Solar Thermal Collector Shipments by Type, Quantity, Revenue, and Average Price, 2008 and 2009 .....	19
Table 2.13 Domestic Shipments of Solar Thermal Collectors by Market Sector, End Use, and Type, 2008 and 2009.....	20
Table 2.14 Average Thermal Performance Rating of Solar Thermal Collectors by Type Shipped in 2009.....	21
Table 2.15 Shipments of Complete Solar Thermal Collector Systems, 2008 and 2009 .....	22
Table 2.16 Number of Companies Expecting to Introduce New Solar Thermal Collector Products in 2010 .....	23
Table 2.17 Percent of Solar Thermal Collector Shipments by the 10 Largest Companies, 2000 - 2009.....	24
Table 2.18 Employment in the Solar Thermal Collector Industry, 2000 - 2009 .....	25
Table 2.19 Companies Involved in Solar Thermal Collector Related Activities by Type, 2008 and 2009.....	26
Table 2.20 Solar-Related Sales as a Percentage of Total Company Sales Revenue, 2008 and 2009 .....	27

## Illustrations

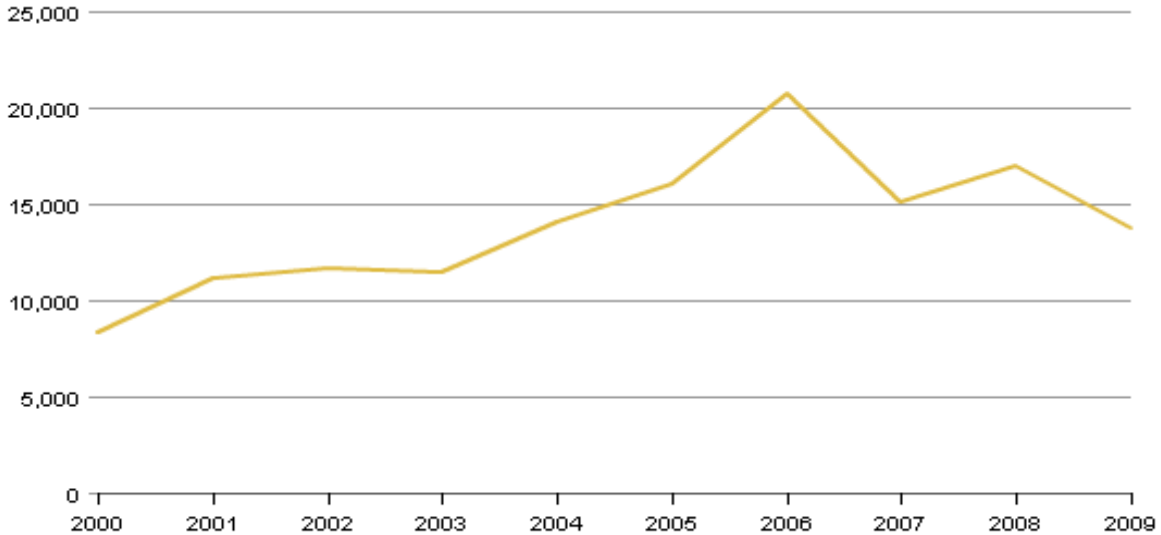
Figure 2.1 Total Solar Thermal Collector Shipments, 2000-2009.....	1
Figure 2.2 Solar Thermal Collector Shipments by Type, 2000-2009.....	4
Figure 2.3 Solar Thermal Collector Average Price, 2000-2009 .....	5

# Solar Thermal Collector Manufacturing Activities 2009

## Overview

Total shipments<sup>1</sup> of solar thermal collectors decreased dramatically in 2009 from 2008, falling almost 19 percent from 17.0 million square feet to 13.8 million square feet. Total shipments in 2009 were down 33 percent from the 2006 record level of 20.7 million square feet (Figure 2.1 and Table 2.1).

**Figure 2.1 Total Solar Thermal Collector Shipments, 2000-2009**  
thousand square feet



Source: U.S. Energy Information Administration (EIA), Form EIA-63A, "Annual solar Thermal Collector Manufacturers Survey."

## Background

Solar thermal collectors are classified as low-, medium-, and high-temperature collectors:

- Low-temperature collectors provide low-grade heat (less than 110 degrees Fahrenheit), through either metallic or nonmetallic absorbers, and are used in such applications as swimming pool heating and low-grade water and space heating.
- Medium-temperature collectors provide medium-grade heat (greater than 110 degrees Fahrenheit, usually 140 degrees to 180 degrees Fahrenheit), either through glazed flat-plate collectors using air or liquid as the heat transfer instrument, or concentrator collectors that concentrate the heat of incident insolation to greater than "one sun,"<sup>2</sup> and are mainly used for domestic hot water heating. Evacuated-tube collectors are also included in this category.

<sup>1</sup> Total shipments as reported by respondents include all domestic and export shipments and may include imported collectors that subsequently were shipped to domestic or foreign customers.

<sup>2</sup> One sun: Natural solar insolation falling on an object without concentration or diffusion of the solar rays.

- High-temperature collectors are parabolic dish or trough collectors designed to operate at a temperature of 180 degrees Fahrenheit or higher, and are primarily used by utilities and independent power producers to generate electricity for the grid.

The solar thermal collector performance rating is an analytically-derived set of numbers representing the characteristic all-day energy output of the solar thermal collector under standard rating conditions, measured in Btu per square foot per day (Btu/ft<sup>2</sup>/day). In 2009, the average solar thermal performance rating for low-temperature collectors (metallic and nonmetallic) was 1,239 Btu/ft<sup>2</sup>/day, medium-temperature (air) was 971 Btu/ft<sup>2</sup>/day, medium-temperature (integral collector storage/thermosiphon) was 913 Btu/ft<sup>2</sup>/day, medium-temperature (flat-plate) was 981 Btu/ft<sup>2</sup>/day, medium-temperature (evacuated-tube) was 973 Btu/ft<sup>2</sup>/day, medium-temperature (concentrator) was 2,196 Btu/ft<sup>2</sup>/day, and high-temperature (parabolic dish/trough) was 1,262 Btu/ft<sup>2</sup>/day (Table 2.14).

### **Industry Status**

In 2009, there were 88 manufacturers and/or importers active in manufacturing, importing, and/or exporting solar thermal collectors, an 18.9-percent increase from the 74 companies operating in 2008. These companies shipped 13.8 million square feet of solar thermal collectors in 2009, compared to 17.0 million square feet in 2008 (Figure 2.1 and Table 2.1).

Of the 88 companies reporting solar thermal collector shipments in 2009, many manufacturers also reported being involved in one or more of the following solar thermal-related activities (Table 2.19):

- 59 designed collectors or systems.
- 27 developed prototype collectors.
- 23 developed prototype systems.
- 61 were involved in wholesale distribution.
- 31 were involved in retail distribution.
- 27 installed collectors.

In addition, several manufacturers are planning to introduce new solar thermal-related products in the 2010 (Table 2.16):

- 4 plan to introduce new low-temperature collectors.

- 16 plan to introduce new medium-temperature collectors.
- 11 plan to introduce new high-temperature collectors.

In 2009, employment in solar-thermal-related activities totaled 1,321 person-years<sup>3</sup>, a nearly 22 percent increase from the 2008 level (Table 2.18). The average employment per company was 15 person-years, compared with 14.6 person-years in 2008.

Fifty-six companies had 90 percent or more of their total company-wide sales revenue in solar thermal-related products, 7 companies had 50 to 89 percent, 12 companies had 10 to 49 percent, and 13 companies had less than 10 percent (Table 2.20).

In 2009, the solar thermal industry remained highly concentrated, with the 5 largest companies accounting for 79 percent of total shipments. This concentration, however, was the lowest recorded in the past 10 years (Table 2.17). The decrease is likely due to the new start-up companies that have entered the market over the last three years.

### **Solar Thermal Collector Shipments**

In 2009, low-temperature collector shipments totaled 10.5 million square feet, about 3.5 million square feet less than the shipments in 2008 (Figure 2.2 and Table 2.3). Nearly 94 percent of low-temperature collectors are used in the residential sector, primarily for pool heating (Table 2.13). However, shipments to the pool heating market fell by more than 25 percent in 2009 compared with shipments in 2008, due partly to declines in U.S. home sales and prices, and the economic downturn.

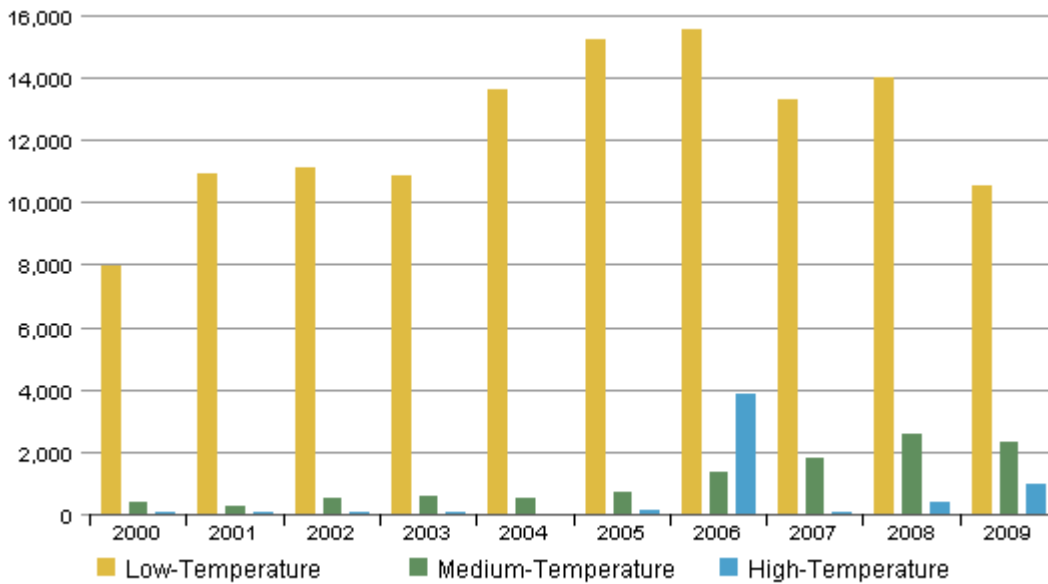
Shipments of medium-temperature collectors totaled 2.3 million square feet in 2009, nearly 10 percent less than the shipments of approximately 2.6 million square feet in 2008 (Figure 2.2 and Table 2.3). The decrease in shipments is believed to be mainly due to the economic recession. Approximately 87 percent of medium-temperature collectors are used for hot water heating (Table 2.13).

High-temperature collector shipments, primarily for utility-scale concentrating solar power (CSP), totaled 978 thousand square feet and represented more than 8 percent of total shipments in 2009.

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<sup>3</sup> Person-year: One whole year, or fraction thereof, worked by an employee, including contracted manpower.

**Figure 2.2 Solar Thermal Collector Shipments by Type, 2000-2009**  
thousand square feet



Source: U.S. Energy Information Administration (EIA), Form EIA-63A, "Annual solar Thermal Collector Manufacturers Survey."

### Total Revenue and Average Price

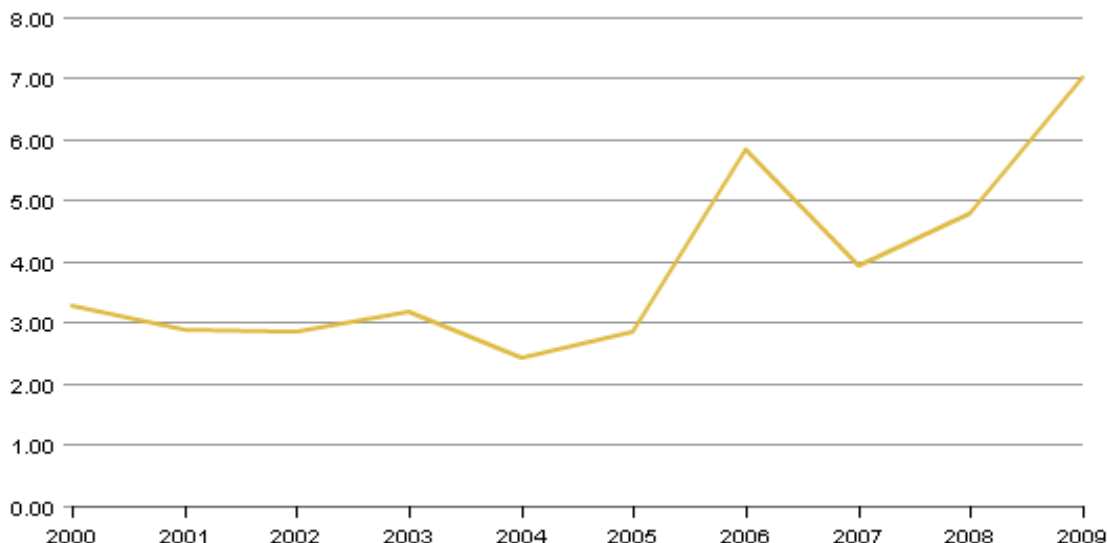
The total revenue<sup>4</sup> of solar thermal collector shipments was \$96.7 million in 2009, an increase of nearly 19 percent from \$81.3 million in 2008 (Table 2.12). Revenue of low-temperature collector shipments was \$20.4 million, a 23-percent decrease compared with the revenue of \$26.5 million in 2008. Revenue of medium-temperature collector shipments was \$51.5 million, about a 3-percent increase compared with the revenue of \$50.1 million in 2008. Revenue of high-temperature collector shipments was \$24.8 million, an increase of about 435 percent compared with the revenue of \$4.6 million in 2008.

The average price for low-temperature collectors was \$1.94 per square foot in 2009, a nearly 3-percent increase from \$1.89 per square foot in 2008. The average price for medium-temperature collectors increased 14 percent from \$19.57 per square foot in 2008 to \$22.32 per square foot in 2009. The average price for high-temperature collectors increased nearly 112 percent from \$11.96 per square foot in 2008 to \$25.32 per square foot in 2009. Overall the average price for total shipments increased more than 46 percent, from \$4.80 per square foot in 2008 to \$7.01 per square foot in 2009 (Figure 2.3 and Table 2.12). The fluctuation in average price was heavily influenced by custom-made collectors, which includes most high-temperature and some medium-temperature collectors. These collectors are designed for limited, specialized applications, and their average prices are much higher than the conventional collectors.

<sup>4</sup> Total revenue as reported by respondents includes revenue from domestic and export shipments and may include imported collectors that subsequently were shipped to domestic or foreign customers.



**Figure 2.3 Solar Thermal Collector Average Price, 2000-2009**  
dollars per square foot



Source: U.S. Energy Information Administration (EIA), Form EIA-63A, "Annual solar Thermal Collector Manufacturers Survey."

### **Domestic Shipments**

Domestic shipments of solar thermal collectors decreased almost 17 percent from a year ago to 12.2 million square feet during 2009. Compared to the 2006 record level, the 2009 level was more than 37 percent lower (Table 2.2).

The residential sector is the largest domestic market in the United States for solar thermal collectors. Solar thermal collectors shipped to the residential sector in 2009 totaled 10.2 million square feet, approximately 84 percent of total domestic shipments (Table 2.13). This market sector primarily involves the use of low-temperature solar collectors for pool heating and medium-temperature solar collectors for water heating. The second largest domestic market for solar thermal collectors in 2009 was the commercial sector, which accounted for nearly 8 percent of total domestic shipments.

The largest end use for solar thermal collectors shipped in 2009 was for swimming pool heating. Pool heating accounted for 73 percent of the total domestic shipments. The second largest end use in 2009 was for domestic hot water heating, which accounted for more than 16 percent of the total domestic shipments (Table 2.13).

More than 33 percent of the total domestic shipments in 2009 went to the wholesale market, nearly 47 percent to retail distribution, almost 3 percent to exporters, less than 8 percent to installers, and more than 9 percent directly to end users (Table 2.11).

## **Complete Systems**

Of the 88 active companies in 2009, 62 companies accounted for shipments of 75,066 complete solar thermal systems. These systems accounted for nearly 6 million square feet, or more than 43 percent, of the total solar thermal collectors shipped in 2009. The revenue from these solar thermal system shipments was reported as approximately \$159 million (Table 2.15).

## **Origin of Shipments**

Imports of solar thermal collectors totaled almost 3.5 million square feet in 2009 (Table 2.7). More than 57 percent of all imports were low-temperature collectors (nearly 2 million square feet). These imports originated in thirteen foreign countries, and about 61 percent (2.1 million square feet) of the solar thermal collectors were imported from Israel (Table 2.8).

In 2009, 73 percent (10 million square feet) of all solar thermal collectors were manufactured in five states (in order of descending volume): California, New Jersey, Florida, Arizona, and Virginia, with 61 percent (8.4 million square feet) of the total shipped from California and New Jersey (Table 2.4).

## **Destination of Shipments**

Export shipments totaled roughly 1.6 million square feet in 2009. About 1.5 million square feet, or more than 98 percent of total exports, were low-temperature solar thermal collectors (Table 2.9). The export market accounted for about 11 percent of total shipments and was dominated by sales to Canada (nearly 32 percent), Mexico (about 25 percent), and France (13 percent) (Table 2.10).

In 2009, almost 12.2 million square feet of domestic solar thermal shipments went to all 50 States, the District of Columbia, the Virgin Islands, Guam, and Puerto Rico (Table 2.6). Nearly two-thirds were shipped to the top five destinations (states): Florida, California, Arizona, Hawaii, and Oregon. California and Florida received 53 percent of total shipments (Table 2.4 and Table 2.6).

**Table 2.1 Annual Shipments of Solar Thermal Collectors by Source, 2000 - 2009**

Year	Number of Companies	Collector Shipments (Thousand Square Feet)		
		Imports	Domestically Manufactured	Total
2000	26	2,201	6,153	8,354
2001	26	3,502	7,688	11,189
2002	27	3,068	8,595	11,663
2003	26	2,986	8,457	11,444
2004	24	3,723	10,392	14,114
2005	25	4,546	11,495	16,041
2006	44	4,244	16,500	20,744
2007	60	3,891	11,262	15,153
2008	74	5,517	11,446	16,963
2009	88	3,456	10,342	13,798

**Notes:** Totals may not equal sum of components due to independent rounding.

Domestically manufactured shipments include those made in U.S. Territories.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.2 Annual Shipments of Solar Thermal Collectors by Disposition, 2000 - 2009  
(Thousand Square Feet)**

Year	Number of Companies	Collector Shipments (Thousand Square Feet)		
		Exports	Domestic Shipments	Total
2000	26	496	7,857	8,354
2001	26	840	10,349	11,189
2002	27	659	11,004	11,663
2003	26	518	10,926	11,444
2004	24	813	13,301	14,114
2005	25	1,361	14,680	16,041
2006	44	1,211	19,532	20,744
2007	60	1,376	13,777	15,153
2008	74	2,247	14,716	16,963
2009	88	1,577	12,221	13,798

**Notes:** Totals may not equal sum of components due to independent rounding.

Domestic shipments include those shipped to U.S. Territories.

Total shipments as reported by respondents include all domestic and export shipments and may include imported collectors that subsequently were shipped to domestic or foreign customers.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.3 Annual Shipments of Solar Thermal Collectors by Type, 2000 - 2009**

(Thousand Square Feet)

Year	Low-Temperature		Medium-Temperature		High-Temperature
	Total Shipments	Average per Manufacturer	Total Shipments	Average per Manufacturer	Total Shipments <sup>1</sup>
2000	7,948	723	400	25	5
2001	10,919	1,092	268	16	2
2002	11,126	856	535	31	2
2003	10,877	906	560	33	7
2004	13,608	1,512	506	30	-
2005	15,224	1,522	702	41	115
2006	15,546	1,413	1,346	38	3,852
2007	13,323	1,025	1,797	35	33
2008	14,015	1,274	2,560	41	388
2009	10,511	809	2,307	32	980

<sup>1</sup>For high-temperature average annual shipments per manufacturer are not disclosed.

- = No data reported.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.4 Shipments of Solar Thermal Collectors Ranked by Origin and Destination, 2009**

Origin/Destination	2009 Shipments	
	Thousand Square Feet	Percent of U.S.Total
Origin		
Top Five States	10,031	73
California	4,402	32
New Jersey	4,019	29
Florida	1,299	9
Arizona	164	1
Virginia	148	1
Other Domestic	311	2
Imported	3,456	25
<b>U.S. Total</b>	<b>13,798</b>	<b>100</b>
Destination		
Top Five States	8,961	65
Florida	3,771	27
California	3,537	26
Arizona	745	5
Hawaii	520	4
Oregon	387	3
Other Domestic	3,260	24
Exported	1,577	11
<b>U.S. Total</b>	<b>13,798</b>	<b>100</b>

**Notes:** Totals may not equal sum of components due to independent rounding.

U.S. total includes territories.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.5 Shipments of Solar Thermal Collectors Ranked by Origin and Destination, 2008**

Origin/Destination	2008 Shipments	
	Thousand Square Feet	Percent of U.S.Total
Origin		
Top Five States	10,933	64
California	4,933	29
New Jersey	4,211	25
Florida	1,271	7
Nevada	289	2
Puerto Rico	230	1
Other Domestic	512	3
Imported	5,517	33
<b>U.S. Total</b>	<b>16,963</b>	<b>100</b>
Destination		
Top Five States	11,093	65
Florida	5,175	31
California	3,746	22
Arizona	939	6
Hawaii	780	5
Oregon	452	3
Other Domestic	3,623	21
Exported	2,247	13
<b>U.S. Total</b>	<b>16,963</b>	<b>100</b>

**Notes:** Totals may not equal sum of components due to independent rounding.

U.S. total includes territories.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.6 Shipments of Solar Thermal Collectors by Destination, 2008 and 2009  
(Square Feet)**

Destination	2008	2009
Alabama	8,905	2,938
Alaska	6,529	2,878
Arizona	939,228	745,462
Arkansas	2,512	18,655
California	3,746,327	3,537,009
Colorado	88,680	75,985
Connecticut	230,978	197,196
Delaware	26,482	42,207
District of Columbia	80	1,675
Florida	5,174,765	3,771,020
Georgia	64,518	105,060
Guam	512	362
Hawaii	780,394	520,103
Idaho	10,460	5,854
Illinois	397,234	317,495
Indiana	16,099	98,391
Iowa	7,656	46,121
Kansas	8,553	4,562
Kentucky	28,588	43,849
Louisiana	12,189	9,145
Maine	60,451	35,638
Maryland	27,773	67,250
Massachusetts	108,554	112,073
Michigan	48,915	126,913
Minnesota	137,897	38,655
Mississippi	4,759	1,121
Missouri	6,053	3,758
Montana	8,452	10,541
Nebraska	6,772	2,627
Nevada	233,456	180,192
New Hampshire	29,232	16,694
New Jersey	230,584	185,862
New Mexico	54,751	61,991
New York	411,268	301,014
North Carolina	136,015	118,354
North Dakota	1,242	2,380
Ohio	85,475	191,420
Oklahoma	7,869	5,173
Oregon	452,032	387,217
Pennsylvania	232,063	220,479
Puerto Rico	276,346	101,210
Rhode Island	23,106	11,700
South Carolina	18,913	9,693
South Dakota	1,282	2,426
Tennessee	7,278	3,864
Texas	90,077	176,752
Utah	17,039	37,221
Vermont	66,685	36,984
Virgin Islands of the U.S.	8,745	4,540
Virginia	213,860	108,345
Washington	26,304	29,755
West Virginia	11,786	1,269
Wisconsin	119,242	80,640
Wyoming	716	994
Shipments to United States/Territories	14,715,681	12,220,712
Exported	2,247,116	1,577,061
<b>Total Shipments</b>	<b>16,962,797</b>	<b>13,797,773</b>

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."



**Table 2.7 Import Shipments of Solar Thermal Collectors by Type, 2000 - 2009**  
**(Thousand Square Feet)**

Year	Type			Total
	Low-Temperature	Medium-Temperature	High-Temperature	
2000	2,188	10	2	2,201
2001	3,500	2	-	3,502
2002	3,066	2	-	3,068
2003	2,984	2	-	2,986
2004	3,702	21	-	3,723
2005	4,513	33	-	4,546
2006	3,979	265	-	4,244
2007	3,501	390	-	3,891
2008	4,831	687	-	5,517
2009	1,987	715	754	3,456

- = No data reported.

**Note:** Totals may not equal sum of components due to independent rounding.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.8 Import Shipments of Solar Thermal Collectors by Country, 2008 and 2009  
(Square Feet)**

Region/Country	2008	2009	Percent of U.S. Imports 2009
Asia			
China	318,123	591,459	17.11
Israel	4,904,128	2,110,847	61.08
Total	5,222,251	2,702,306	78.20
Australia and Oceania			
Australia	44,814	25,620	0.74
Total	44,814	25,620	0.74
Europe			
Austria	5,132	12,500	0.36
Federal Republic of Germany	91,670	553,946	16.03
France	32,180	42,849	1.24
Hungary	-	25,300	0.73
Ireland	-	1,593	0.05
Italy	-	2,700	0.08
Portugal	729	12,000	0.35
Turkey	36,882	25,361	0.73
United Kingdom	33,286	35,599	1.03
Total	199,879	711,848	20.60
North America			
Canada	50,347	16,072	0.47
Total	50,347	16,072	0.47
<b>U.S. Total</b>	<b>5,517,291</b>	<b>3,455,846</b>	<b>100.00</b>

- = No data reported.

**Note:** Totals may not equal sum of components due to independent rounding.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.9 Export Shipments of Solar Thermal Collectors by Type, 2000 - 2009**  
**(Thousand Square Feet)**

Year	Type			Total
	Low-Temperature	Medium-Temperature	High-Temperature	
2000	486	10	s	496
2001	827	13	-	840
2002	654	3	2	659
2003	510	5	2	518
2004	809	4	-	813
2005	1,349	10	2	1,361
2006	1,169	42	-	1,211
2007	1,338	33	5	1,376
2008	2,115	128	4	2,247
2009	1,552	23	2	1,577

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

- = No data reported.

**Note:** Totals may not equal sum of components due to independent rounding.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.10 Export Shipments of Solar Thermal Collectors by Country, 2008 and 2009  
(Square Feet)**

Region/Country	2008	2009	Percent of U.S. Exports 2009
Africa			
Egypt	-	1,771	0.11
Morocco	4,755	3,916	0.25
Nigeria	333	-	-
Total	5,088	5,687	0.36
Asia			
Indonesia	-	4,041	0.26
Israel	5,756	-	-
Japan	-	240	0.02
Jordan	-	13,200	0.84
Korea, South	-	336	0.02
Saudi Arabia	51,951	-	-
Taiwan	-	48	*
United Arab Emirates	4,412	-	-
Vietnam	2,640	1,980	0.13
Total	64,759	19,845	1.26
Australia and Oceania			
Australia	81,980	106,459	6.75
New Zealand	11,915	14,106	0.89
Total	93,895	120,565	7.64
Central America			
Antigua and Barbuda	224	2,890	0.18
Aruba	32	-	-
Bahamas	648	1,713	0.11
Belize	170	-	-
Bermuda	787	72	*
British Virgin Islands	8,228	117	*
Cayman Islands	3,496	2,654	0.17
Costa Rica	17,394	12,340	0.78
Dominican Republic	-	44	*
El Salvador	-	1,200	0.08
Guatemala	9,625	6,550	0.42
Honduras	3,233	-	-
Jamaica	5,742	3,684	0.23
Mexico	459,181	387,653	24.58
Netherlands Antilles	1,477	736	0.05
Nicaragua	-	192	0.01
Panama	128	-	-
Trinidad and Tobago	10,819	74	*
Total	521,184	419,919	26.63
Europe			
Austria	-	17,080	1.08
Belgium	11,270	-	-
Cyprus	240	264	0.02
Czech Republic	23,379	15,664	0.99
Federal Republic of Germany	71,254	99,352	6.30
France	150,509	206,348	13.08
Hungary	-	72	*
Ireland	-	48	*
Italy	-	14,846	0.94
Malta	1,344	-	-
Portugal	240	-	-
Romania	8,157	11,924	0.76
Russian Federation	900	676	0.04
Spain	73,283	81,506	5.17
Sweden	22,230	-	-
Switzerland	6,065	7,964	0.50
Ukraine	40	-	-
United Kingdom	485	1,443	0.09
Total	369,396	457,187	28.99
North America			
Canada	804,969	499,278	31.66
Total	804,969	499,278	31.66
South America			
Argentina	5,616	12,871	0.82
Bolivia	19,032	17,458	1.11
Brazil	331,518	-	-
Chile	11,249	12,779	0.81
Colombia	3,596	874	0.06
Ecuador	1,478	10,598	0.67
Peru	15,336	-	-
Total	387,825	54,580	3.46

**Table 2.10 Export Shipments of Solar Thermal Collectors by Country, 2008 and 2009 (Square Feet) (Continued)**

Region/Country	2008	2009	Percent of U.S. Exports 2009
<b>U.S. Total</b>	<b>2,247,116</b>	<b>1,577,061</b>	<b>100.00</b>

\* = Less than 0.01 percent.

- = No data reported.

**Note:** Totals may not equal sum of components due to independent rounding.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.11 Distribution of Domestic Solar Thermal Collector Shipments by Customer Type, 2008 and 2009  
(Thousand Square Feet)**

Customer Type	Shipments	
	2008	2009
Wholesale Distributors	8,680	4,063
Retail Distributors	3,997	5,739
Exporters	368	346
Installers	948	939
End Users	723	1,134
<b>U.S. Total</b>	<b>14,716</b>	<b>12,221</b>

**Notes:** Totals may not equal sum of components due to independent rounding.  
U.S. total includes territories.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.12 Solar Thermal Collector Shipments by Type, Quantity, Revenue, and Average Price, 2008 and 2009**

Type	2008			2009		
	Quantity (Thousand Square Feet)	Revenue (Thousand Dollars)	Average Price (Dollars per Square Feet)	Quantity (Thousand Square Feet)	Revenue (Thousand Dollars)	Average Price (Dollars per Square Feet)
Low-Temperature						
Liquid and Air	14,015	26,518	1.89	10,511	20,411	1.94
Medium-Temperature	2,560	50,109	19.57	2,307	51,483	22.32
Air	28	W	W	22	W	W
Liquid						
ICS/Thermosiphon	321	6,631	20.66	147	4,830	32.80
Flat Plate	1,842	32,043	17.40	1,783	34,642	19.43
Evacuated Tube	351	9,009	25.69	328	8,481	25.88
Concentrator	19	W	W	27	W	W
High-Temperature						
Parabolic Dish/Trough	388	4,640	11.96	980	24,814	25.32
<b>U.S. Total</b>	<b>16,963</b>	<b>81,348</b>	<b>4.80</b>	<b>13,798</b>	<b>96,708</b>	<b>7.01</b>

W = Data withheld to avoid disclosure of proprietary company data.

**Note:** Totals may not equal sum of components due to independent rounding.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.13 Domestic Shipments of Solar Thermal Collectors by Market Sector, End Use, and Type, 2008 and 2009**

(Thousand Square Feet)

Market Sector/End Use	Type							2009 Total	2008 Total
	Low-Temperature	Medium-Temperature				High-Temperature			
	Liquid/Air	Air	Liquid			Parabolic Dish/Trough			
	Metallic and Nonmetallic		ICS/Thermosiphon	Flat-Plate (Pumped)	Evacuated Tube		Concentrator		
Market Sector									
Residential	8,423	17	134	1,466	199	-	-	10,239	13,000
Commercial	526	4	7	278	123	26	10	974	1,294
Industrial	11	-	-	27	1	-	594	634	128
Electric Power	-	-	-	-	-	-	374	374	294
Transportation	-	-	-	-	-	-	-	-	-
<b>U.S. Total</b>	<b>8,959</b>	<b>21</b>	<b>141</b>	<b>1,771</b>	<b>324</b>	<b>26</b>	<b>978</b>	<b>12,221</b>	<b>14,716</b>
End Use									
Pool Heating	8,882	-	-	47	5	-	-	8,934	11,973
Hot Water	7	5	141	1,553	286	-	-	1,992	1,978
Space Heating	61	14	-	70	5	-	-	150	186
Space Cooling	-	s	-	-	-	-	10	10	18
Combined Space and Water Heating	9	2	-	100	27	-	-	137	148
Process Heating	-	-	-	2	s	11	594	608	50
Electricity Generation	-	-	-	-	-	15	374	389	361
<b>U.S. Total</b>	<b>8,959</b>	<b>21</b>	<b>141</b>	<b>1,771</b>	<b>324</b>	<b>26</b>	<b>978</b>	<b>12,221</b>	<b>14,716</b>

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

- = No data reported.

**Note:** Totals may not equal sum of components due to independent rounding.

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."



**Table 2.14 Average Thermal Performance Rating of Solar Thermal Collectors by Type Shipped in 2009  
(Btu per square foot per day)**

Year	Type						
	Low-Temperature	Medium-Temperature				High-Temperature	
	Liquid/Air	Air	Liquid			Parabolic Dish/Trough	
	Metallic and Nonmetallic		ICS/Thermosiphon	Flat-Plate (Pumped)	Evacuated Tube		Concentrator
2009	1,239	971	913	981	973	2,196	1,262

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.15 Shipments of Complete Solar Thermal Collector Systems, 2008 and 2009**

<b>Shipment Information</b>	<b>2008</b>	<b>2009</b>
Complete Collector Systems Shipped	63,961	75,066
Thousand Square Feet	4,058	5,995
Percent of Total Shipments	24	43
Number of Companies	46	62
Revenue of Systems (Thousand Dollars)	47,523	159,085

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.16 Number of Companies Expecting to Introduce New Solar Thermal Collector Products in 2010**

New Product Type	Number of Companies
Low-Temperature Collectors	4
Medium-Temperature Collectors	16
High-Temperature Collectors	11
Noncollector Components	12

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.17 Percent of Solar Thermal Collector Shipments by the 10 Largest Companies, 2000 - 2009**

Year	Company Rank	Shipments (Thousand Square Feet)	Percent of Total Shipments
2000	1-5	7,521	90
	6-10	567	7
2001	1-5	10,732	96
	6-10	325	3
2002	1-5	10,755	92
	6-10	670	6
2003	1-5	10,485	92
	6-10	700	6
2004	1-5	13,291	94
	6-10	664	5
2005	1-5	14,801	92
	6-10	934	6
2006	1-5	18,535	89
	6-10	1,484	7
2007	1-5	13,015	86
	6-10	1,202	8
2008	1-5	14,023	83
	6-10	1,453	9
2009	1-5	10,868	79
	6-10	1,538	11

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.18 Employment in the Solar Thermal Collector Industry, 2000 - 2009**

<b>Year</b>	<b>Person- Years</b>
2000	284
2001	256
2002	356
2003	287
2004	317
2005	353
2006	1,069
2007	686
2008	1,083
2009	1,321

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.19 Companies Involved in Solar Thermal Collector Related Activities by Type, 2008 and 2009**

Type of Activity	2008	2009
Collector or System Design	45	59
Prototype Collector Development	27	27
Prototype System Development	23	23
Wholesale Distribution	58	61
Retail Distribution	29	31
Installation	21	27
Noncollector System Component Manufacture	26	32

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.20 Solar-Related Sales as a Percentage of Total Company Sales Revenue, 2008 and 2009**

Percent of Total Sales Revenue	Number of Companies	
	2008	2009
90-100	49	56
50-89	9	7
10-49	7	12
Less than 10	9	13
<b>U.S. Total</b>	<b>74</b>	<b>88</b>

**Source:** U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."